Ericsson MD110 PBX

Supports Management Module SM-ERC1000

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Device Management

Contents

Introduction

This section introduces the SPECTRUM Device Management documentation for the Ericsson MD110 PBX device.

This introduction to the Device Management for the Ericsson MD110 PBX contains the following information:

- Purpose and Scope
- Required Reading
- Supported Device on Page 6
- The SPECTRUM Model on Page 6

Purpose and Scope

Use this documentation as a guide for managing the Ericsson MD110 PBX (herein referred to as the MD110) with the SPECTRUM management module SM-ERC1000. The documentation describes the icons, menus, and views that enable you to remotely monitor, configure, and troubleshoot devices through software models in your SPECTRUM database.

Only information specific to the supported management module is included under this documentation topic. For general information about device management using SPECTRUM and for explanations of basic SPECTRUM functionality and navigation techniques, refer to the topics listed under *Required Reading*.

Required Reading

To use this documentation effectively, you must be familiar with the information covered by these other SPECTRUM online documentation topics:

- ***Getting Started with SPECTRUM for Operators***
- ***Getting Started with SPECTRUM for Administrators***
- ***How To Manage Your Network with SPECTRUM***
- ***SPECTRUM Views***
- ***SPECTRUM Menus***

- **SPECTRUM Icons**

- **Management Module Software Release Notice**

Supported Device

The SPECTRUM management module SM-ERC1000 currently allows you to model the MD110, described below.

The MD110 is a high-capacity digital voice-data PBX, carrying data transparently through a common networked system. The MD110:

- network can consist of on-premise hard-wired, wireless nodes, or wide area networked links

- can provide cordless communication for all users in an office environment, independent of the size of the organization

- operates in a coherent "single system" mode and offers customizable capabilities

- allows full computer telephony internetworking with computer-supported telephony systems

- contains LIMs (Line Interface Modules) that can be distributed throughout one or many sites, and is managed from a terminal using the MD110 proprietary interface

The SPECTRUM Model

SPECTRUM uses a single device model type, **MD110_PBX**, for modeling each MD110 in the network.

The managed MD110 requires you to install Ericsson's agent, which provides the SNMP interface for SPECTRUM. The SNMP agent exists as a stand-alone unit for a single MD110 or as a chassis package including up to eight agents.

MD110_PBX models are represented in SpectroGRAPH views by Device icons. As shown in Figure 1, the appearance of the Device icon varies slightly depending on the kind of view in which it appears.

Figure 1:   Small and Large Device Icons

Small Device icon appears in Topology, Device Topology, Application, and Container views.

Large Device icon appears in Device Topology, Org Owns, Location, and Interface Device views.
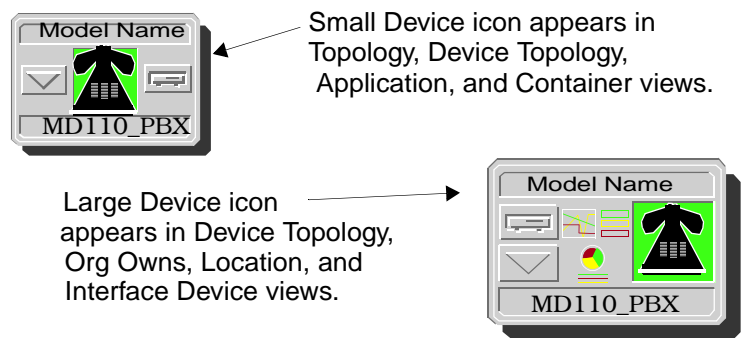
Through its double-click zones and its **Icon Subviews** menu, the Device icon is your starting point for accessing the views and other displays that let you perform device management activities such as those listed in the *Tasks* section immediately following this introduction.

The device-specific Icon Subviews menu options available from the Device icon are listed below.

Option	Accesses the...
Fault Management	Fault Management View, which is described in the **How to Manage Your Network with SPECTRUM** documentation.
Device	*Device Views* (Page 10)
Device Topology	*Device Topology View* (Page 13)
Application	*Application View* (Page 18)
Configuration	*Configuration Views* (Page 21)
Model Information	*Model Information Views* (Page 39)
Primary Application	Menu options that let you select either Gen Bridge App or MIB-II as the primary application.

The rest of the documentation for this management module is organized according to view type, as follows.

- *Device Views* on Page 10
- *Device Topology View* on Page 13
- *Application View* on Page 18
- *Configuration Views* on Page 21
- *Performance Views* on Page 37
- *Model Information Views* on Page 39

Tasks

This section lists device management tasks alphabetically and provides links to descriptions of the views and/or tables used to perform the task.

Application Information (examine)

- *Application View* on Page 18

Computer Telephony Interfaces (configure)

- *Computer Telephony Interfaces Table View* on Page 27

Device Connections (configure)

- *Device Topology View* on Page 13

Device (configure)

- *Configuration Views* on Page 21

Device Performance (monitor)

- *Device Performance View* on Page 37
- *Device Views* on Page 10

Interfaces (enable/disable)

- *Admin Status* on Page 36

Line Interface Modules (examine/configure)

- *Line Interface Module Labels* on Page 12
- *LIM Table View* on Page 33

Model Information (examine)

- *Model Information Views* on Page 39

Model Redundancy (configure)

- *Device Configuration View* on Page 35

ISDN Basic Rate Extensions (monitoring)

- *ISDN Basic Rate Extensions Table View* on Page 27

Interfaces (examine)

- *Device Views* on Page 10
- *Performance Views* on Page 37
- *Interface Icon Subviews Menu Options* on Page 15
- *Alarm Information View* on Page 30

- *External Alarms Table* on Page 30
- *PIN Alarm Information View* on Page 31

Port Configuration (examine/modify)

- *Interface Icons* on Page 14
- *Device Configuration View* on Page 35
- *Interface Configuration View* on Page 36

Port Statistics (monitor)

- *Interface Performance View* on Page 38

Radio Exchange Information (examine)

- *Radio Exchange Table View* on Page 29

Port Connections (resolve)

- *Device Topology View* on Page 13

Interface Thresholds (configure)

- *Interface Thresholds View* on Page 17

Interface Address Information (examine)

- *Interface Address Translation Table View* on Page 16
- *Secondary Address Panel* on Page 16

Device Views

This section describes the Device view and subviews available for models of the MD110 device in SPECTRUM.

Device views use icons and labels to represent the modeled device and its components, such as modules, ports or interfaces, and applications. The icons and corresponding double-click areas are described below.

Device View

Access: *From the Icon Subviews menu for the MD110_PBX Device icon, select Device.*

This view contains icons that represent the LIMs (Line Interface Modules) installed within the chassis of the modeled device. Each Module icon identifies the type of module. Individual interfaces on the modules are represented by smaller icons that dynamically display current operational status.

Figure 2 shows the LIMs in the Device view which together constitute a manageable MD110. Each MD110 chassis modeled in SPECTRUM is represented as a single chassis module icon (refer to Figure 3, *Module Icons*). Individual LIMs within the chassis module are represented by smaller

icons located on the module icon, Information for each LIM is current, and is updated dynamically.

Figure 2:   MD110 Device View
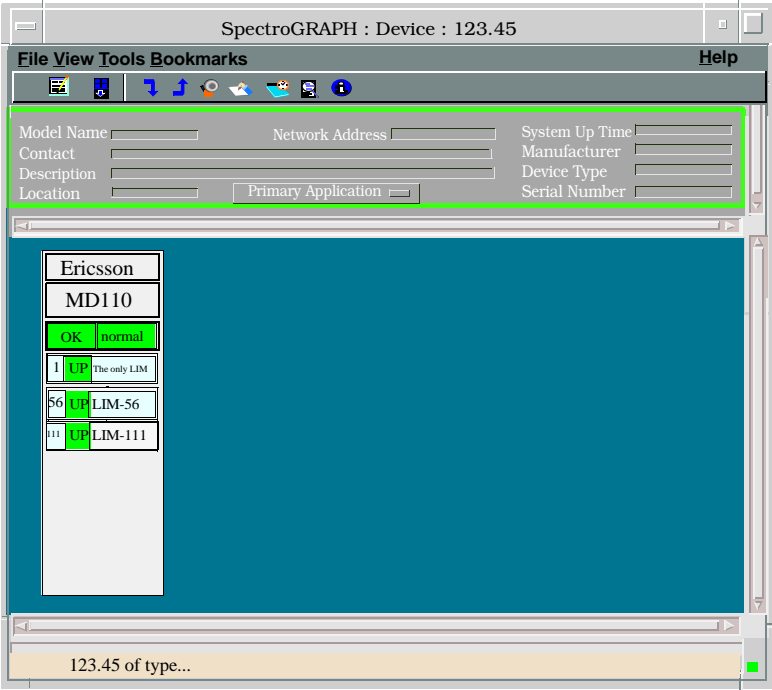
Module Icons

Figure 3 shows a close-up of the Module icon from the MD110 Device view. Note that there are two types of labels on the icon: those that apply to the chassis module as a whole, and those that apply to individual LIMs within the module.
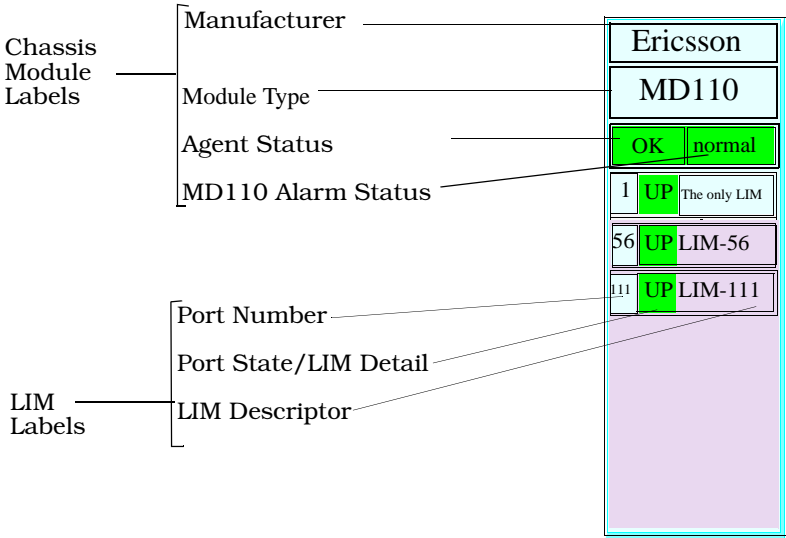
Chassis Module Labels

The following labels are located at the top of each Module icon:

- **Manufacturer -** The module manufacturer's name, or other user-provided identification information. This double-click zone accesses the *Route and Trunk Information View* on Page 32.
- **Module Type** - The type of module inserted in this chassis slot—e.g., MD110. This double-click zone accesses the *Interfaces Information View* on Page 24.

- **Agent Status** - Indicates the agent is in the `OK`, `linkdown`, `updatingMIB`, or `agentFault` mode. Information will only be valid when the Agent Status is `OK`. This double-click zone accesses the *MD110 Configuration View* on Page 22.

- **Alarm Status** - Indicates the severity of the highest active alarm detected by the agent. The states are `normal`, `warning`, `minor`, `major`, or `critical`.

Figure 3:   Module Icons

Chassis Module Icon Subviews Menu

Table 1 lists the **Icon Subviews** menu options for a chassis module.

Table 1:   LIM Label Icon Subviews Menu

Selection	Description
Notes	Allows you to record notes for the MD110_App.
Route/Trunk Information	See *Route and Trunk Information View* on Page 32.
Interfaces Information	See *Interfaces Information View* on Page 24.
Configuration	See *MD110 Configuration View* on Page 22.
LIM Information	See *LIM Table View* on Page 33 for text values on each LIM (Line Interface Module).

Line Interface Module Labels

As shown in Figure 3, each selectable LIM label on a port icon comprises three smaller labels. Clicking any of these labels lets you access the port-specific menu options listed in Table 2.

- **Port Number** - Identifies a particular LIM. The ports shown correspond to entries in the LIM table. Double-click this label to open a Port Notes view that allows you make, revise, save, retrieve, and mail annotations about the LIM.

- **Port Status** - Displays the current operating status of the LIM and the corresponding color for that status (green if the port is up, red if the port is down or in test mode). Double-click this label to open the MD110 LIM Detail view, which allows you to write to the MD110's LIM location and identification fields. See *LIM Table View* on Page 33 for more information.

- **Port Statistics** - Displays the LIM (Line Interface Module) location. This is a writeable attribute within the agent and the default value can be updated by the user.

Port Label Icon Subviews Menu

Table 2 lists the **Icon Subviews** menu options for port labels within the Device view.

Table 2:   Port Label Icon Subviews Menu

Menu Option	Description
Notes	Allows you to revise, retrieve, create, save, and/or mail notes for the MD110_App.
Port Notes	Opens the Notes view, which allows you to record notes for the GnPort.
LIM Detail	Opens the LIM Detail view, which provides the text value for the LIM location, and the MD110 internal topology information for this module port.

Device Topology View

This section provides a brief description of the Device Topology view available for models of the MD110 device in SPECTRUM.

The Device Topology view shows the connections between a modeled device and other network entities.

Device Topology View

Access: From the **Icon Subviews** menu for the MD110_PBX Device icon, select **DevTop.**

The lower panel of the Interface Device Topology view (Figure 4) uses interface icons to represent the device's serial/network I/O ports. If there is a device connected to a particular interface, a device icon appears on the vertical bar above the interface icon along with an icon representing the network group that contains the device.

Figure 4:   **Device Topologyy View**
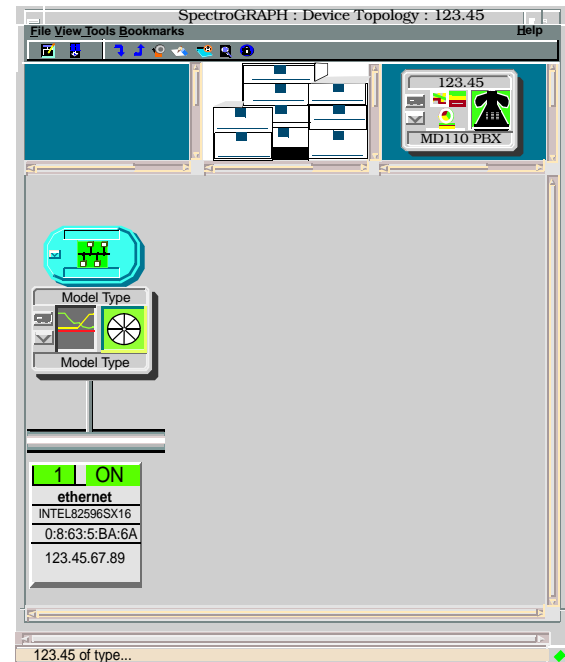
Interface Icons

Figure 5 shows a close-up of an Interface icon from an Interface Device Topology view. Most of the informational labels on the icon also provide double-click access to other views, as explained in the following label descriptions.

Figure 5:   Interface Icon

a   *Interface Number Label*

b   *IF Status Label*

c   *Interface Type Label*

d   *Network Type Label*

e   *Physical Address Label*

f   *IP Address Label*
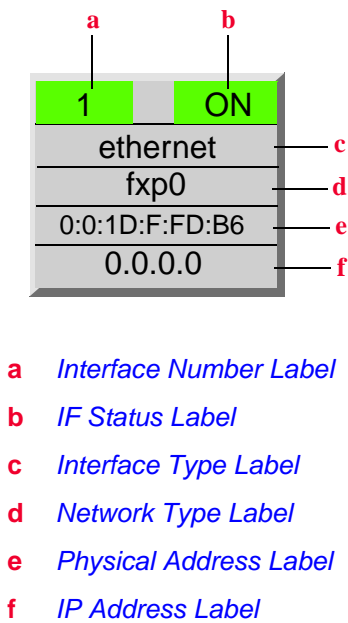
Interface Number Label
This label displays the interface number.

IF Status Label
This label displays the current Operational Status of the interface (see Table 3). Note that the background color of the label also depends on the interface's current Administrative Status, which is set by the user (see *Interface Status View* on Page 16). This view can be accessed by double-clicking the label.

Table 3:   Interface Status Label Colors

Color	Operational Status	Administrative Status	Label Text
Green	ON	ON	ON
Blue	OFF	OFF	OFF
Yellow	OFF	ON	OFF
Red	Testing	Test	Test

Interface Type Label
This label identifies the type of interface—e.g., Ethernet, FDDI, Other, etc. Double-click this label to access Interface Configuration view. For a description, see *Interface Configuration View* on Page 36.

Physical Address Label

This label displays the physical (MAC) address of the interface.

IP Address Label

This label displays the IP address for the interface. Double click this label to access the Secondary Address Panel (described under *Secondary Address Panel* on Page 16).

Gauge Label

This label displays whichever performance statistic has been selected in the Gauge Control panel for the interfaces (see the **SPECTRUM Views** documentation for more information). Double-click this label to open the agent's Interface Performance view, described under *Interface Performance View* on Page 38.

Network Type Label

This label identifies the type of network the agent interface is connected to. Double-click the label to open the Model Information view for the interface.

Interface Icon Subviews Menu Options

Table 4 lists the Icon Subviews menu options available for the Interface icon.

Table 4:　Interface Icon Subviews Menu Options

Menu Option	Opens the...
Performance	*Interface Performance View* on Page 38
Detail	Interface Detail view, which displays Packet, Error, and Discard Breakdown pie charts.
IF Status	*Interface Status View* on Page 16
IF Configuration	*Interface Configuration View* on Page 36
AT IF Address Translation Table	*Interface Address Translation Table View* on Page 16
Secondary Address Panel	*Secondary Address Panel* on Page 16
Thresholds	*Interface Thresholds View* on Page 17
Model Information	*Model Information Views* on Page 39

Interface Status View

Access: *From the **Icon Subviews** menu for the Interface icon in the Interface Device view, select **IF Status**.*

This view provides information on the operational status of the interface and allows you to enable or disable the port.

Operational Status
The current state of the interface (`ON, OFF`, or `Testing`).

Administrative Status
This button allows you to select the desired operational state of the interface (`ON, OFF, or Testing`).

Secondary Address Panel

Access: *From the **Icon Subviews** menu for the Interface icon in the Interface Device view, select **Secondary Address Panel**.*

This panel provides a table that cross-references network addresses (IP addresses) to physical (MAC) addresses for selected nodes between networks. The addresses are obtained from the Address Translation table within the firmware. Change the current address displayed in the **IP Address** field by selecting an entry from the table and clicking **Update**.

Interface Address Translation Table View

Access: *From the **Icon Subviews** menu for the Interface icon in the Interface Device view, select **IF Address Translation Table**.*

This view displays interface address information for ports connected to the MD110.

Interface Index
A unique value for each interface. Its value ranges between 1 and the highest index value. The value 0 for each interface must remain constant at least from one reinitialization of the entity's network management system to the next reinitialization.

Physical Address
The interface's address at the protocol layer immediately below IP in the protocol stack. The Ethernet address of the bridge is returned, for both channels of the bridge.

Network Address
The network address for the interface.

Interface Thresholds View

This view displays the thresholds that can be set for a particular interface. The thresholds are used to generate alarms that will notify you when a condition exists that you have determined to be undesirable. Example: excessive traffic on this interface.

Load Threshold
Allows you to set the values to determine the point at which the percent load will generate an alarm (on) and the point at which it will shut the alarm off (off).

Packet Rate Threshold
Allows you to set the values to determine the point at which the packet rate will generate an alarm (on) and the point at which it will shut the alarm off (off).

Error Rate Threshold
Allows you to set the values to determine the point at which the error rate will generate an alarm (on) and the point at which it will shut the alarm off (off).

% Discarded Threshold
Allows you to set the values to determine the point at which the percent of discarded packets will generate an alarm (on) and the point at which it will shut the alarm off (off).

Application View

This section describes the Application view and the associated application-specific subviews available for the MD110 in SPECTRUM.

Access: *From the **Icon Subviews** menu for the MD110 PBX Device icon, select **Application.***

When a device model is created, SPECTRUM automatically creates models for each of the major and minor applications supported by the device. The Application view identifies all of these application models, shows their current condition status, and provides access to application-specific subviews.

Figure 6 shows an Application view in its default mode (Icon) where each of the application models is represented by an Application icon. The Application icons are arranged hierarchically under a Device icon, with major applications in the top row and their respective minor applications stacked directly below.

If you prefer to see applications displayed by name only, in a single vertical list, select **View > Mode > List.**

Figure 6:   **MD110 Application View**
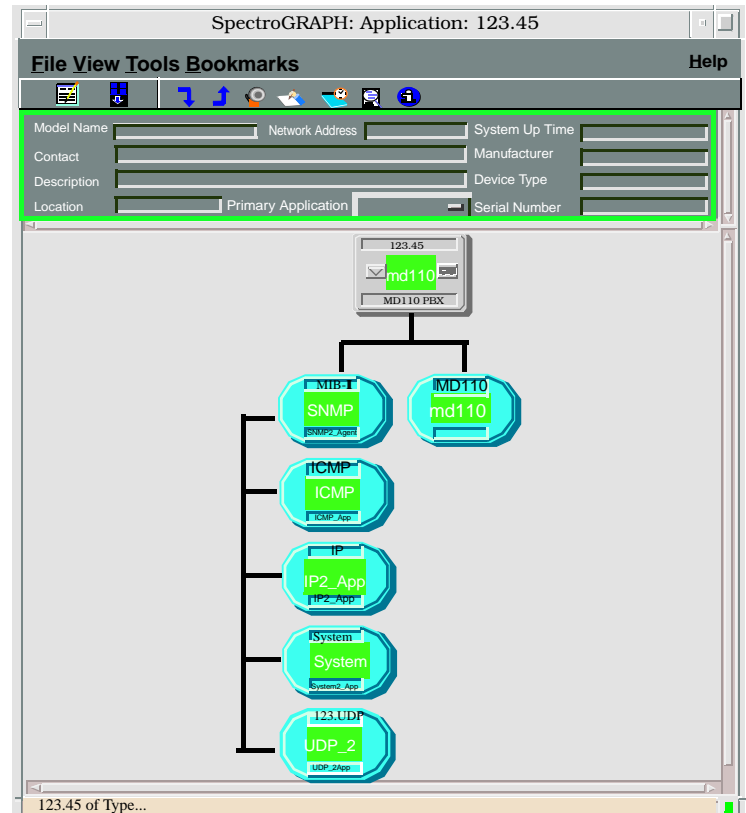
Supported Applications

SPECTRUM's applications can be grouped within two general categories as follows:

- Applications associated with non proprietary MIBs. See *Common Applications* below.
- Applications associated with device-specific MIBs. See *Device-Specific MIBs* (Page 20).

Common Applications

For the most part, these applications represent the non proprietary MIBs supported by your device. Listed below (beneath the title of the SPECTRUM document that describes them) are some of the common applications currently supported by SPECTRUM.

> **Note:** The documents listed below (in bold font) are available for viewing at:
>
> www.aprisma.com/manuals/

- **Routing Applications**
  - Generic Routing
  - Repeater
  - AppleTalk
  - DECnet
  - OSPF

- OSPF2
- BGP4
- VRRP

- **Bridging Applications**
  - Ethernet Special Database
  - Spanning Tree
  - Static
  - Transparent
  - PPP Bridging
  - Source Routing
  - Translation
  - QBridge

- **MIB II Applications**
  - SNMP
  - IP
  - ICMP
  - TCP
  - System2
  - UDP

- **Transmission Applications**
  - FDDI
  - Point to Point
  - DS1
  - DS3
  - RS-232
  - WAN

- Frame Relay
- Token Ring
- Ethernet
- Fast Ethernet
- rfc1317App
- rfc1285App
- rfc1315App
- 802.11App
- SONET

- *Technology Applications*
  - APPN
  - ATM Client
  - DHCP
  - PNNI
  - rfc1316App
  - DLSw

Device-Specific MIBs

SPECTRUM imports the following device-level proprietary MIBs into its database:

- MD110 SNMP MIB Rev 1.13
- Dynamic Network Administration MIB Rev 1.3

These MIBs can be used in conjunction with SPECTRUM's optional customization products (referred to as the Level I Tool Kits) to create

application models and views that display the condition of selected MIB objects.

Note: Aprisma Management Technologies can provide training, technical assistance, and custom engineering support services for creating application models and their associated views.

There is one major device-specific application available for the MD110 PBX; the MD110_App. The views and subviews available for this application are described under *MD110 Configuration View* on Page 22.

Configuration Views

This section describes various Configuration views and subviews for models of MD110 devices in SPECTRUM.

Configuration views allow you to view and modify current settings for the modeled device and its interfaces or ports and applications. The following Configuration views are available for models of MD110 devices:

- *MD110 Configuration View* on Page 22
- *Interfaces Information View* on Page 24
- *Alarm Information View* on Page 30
- *Route and Trunk Information View* on Page 32
- *LIM Table View* on Page 33
- *Group Switch Information View* on Page 33
- *Agent Information View* on Page 34
- *Device Configuration View* on Page 36

An example of the MD110 Configuration view is shown in Figure 7.

Figure 7: MD110 Configuration View
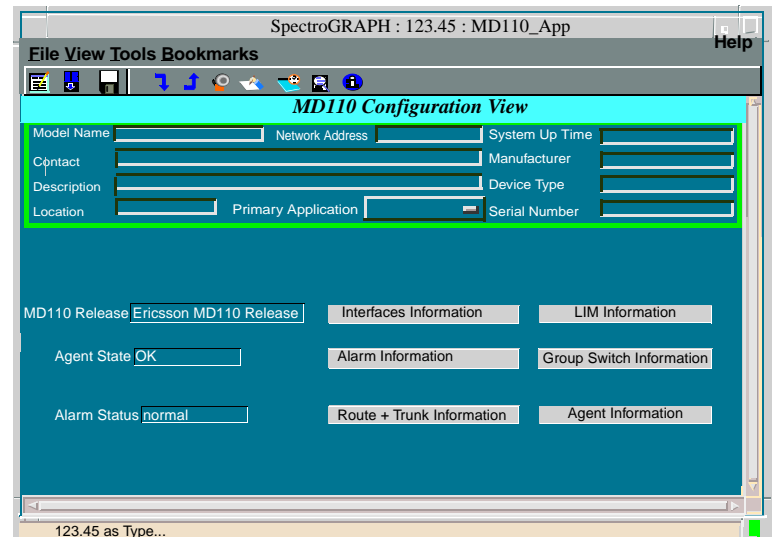
MD110 Configuration View

Access: *From the* **Icon Subviews** *menu for the Device icon, select* **MD110 Configuration.**

The MD110 Configuration view and its subviews are used for creating additional models to represent the device chassis and its LIMs. An iconical representation of the new models will appear in the Device view. The view buttons and fields are described below.

MD110 Release
The manager-defined release number (2, 3, or 4). This field is not dynamically updated by the MD110 Agent, and may show the Ericsson MD110 Release text string.

Agent State
The state of the connection between the MD110 and the agent. The values are described in Table 5.

Alarm Status
The current alarm status of the MD 110 node. The alarm states and definitions are listed in

Table 5:   Agent Connection States

Connection State	Definition
OK	The agent established a connection to the attached MD110 and all MIB objects are instrumented.
linkdown	The connection between the agent and MD110 is down.
updating MIB	The communication between the agent and MD110 is working and the agent is updating the information base. The agent can not yet provide its services to any manager.
agentFault	The agent is out of operation due to internal fault.

Table 6.

Table 6:   MD110 Alarm States

Alarm State	Definitions
Critical	Any Active A4 alarms.
Major	Any active A3 alarms but no active higher alarms or Agent is not operational. AgentState is not 1.
Minor	Any active A2 alarms but no active higher alarms.
Warning	Any active A1 alarms but no active higher alarms.
Indeterminate	Status unknown.
Normal	Any active A0 or no active alarm but no active higher alarms.

Interfaces Information

Refer to the Interfaces Information View on Page 24 for information on Interface Names and Common Interface tables.

Alarm Information

Refer to the Alarm Information View on Page 30.

Route + Trunk Information

Refer to the Route and Trunk Information View on Page 32.

LIM Information

Refer to the LIM Table View on Page 33.

Group Switch Information

Refer to the Group Switch Information View on Page 33.

Agent Information

Refer to the Agent Information View on Page 34.

Interfaces Information View

Access: *From the MD110 Configuration view, click the* **Interfaces Information** *button.*

This view provides information for common interfaces and button access to interface tables. You can sort, find, update, and print this table.

Common Interface Table

This table provides descriptive and status information on the interfaces.

Index
A unique value for each interface. Values ranging between 1 and 8 show interface index and name information; values between 10 and the maximum interface value are a composite of the interface index, name, description, status and alarm class.

Interface Name
The type of interface (i.e., `Ethernet`, `FDDI`, `Loopback`, etc).

Description
A textual string containing information about the interface. This may include endpoint or server information.

Status
The operational state of the interface. The possible states are described in Table 7.

Table 7:   Common Interface States

States	Description
Up	The interface is in the Up state.
Down	The interface is in the Down state.
Unknown	The agent cannot obtain the status of the interface.

Alarm Class
Displays active external alarm error codes. Alarm classes range from `critical` (A4) to `normal` (A0).

Interface Information Buttons

The Interfaces Information view buttons access interface information table views.

ICU Information

Refer to the ICU Interfaces Table View on Page 26.

| OPI Information |

Refer to the OPI Information Table View on Page 26.

| CIL Information |

Refer to the Call Information Logging Table View on Page 27.

| CTI Information |

Refer to the Computer Telephony Interfaces Table View on Page 27.

| ISDN SO Information |

Refer to the ISDN Basic Rate Extensions Table View on Page 27.

| VCU Information |

Refer to the VCU Interfaces Table View on Page 28.

| Server Information |

Refer to the Server (E1/T1 ELU-7) Table View on Page 28.

| Data Extns Information |

Refer to the Data Extensions Table View on Page 29.

| Data Extns Information |

Refer to the DNA Interconnections View on Page 29.

| Radio Exchange Information |

Refer to the Radio Exchange Table View on Page 29.

Interfaces Information Detail Views

The detail views provide varying subsets of information for each interface table, and allow you to change default values.

IF Index
A unique value for each interface. Its value ranges between 1 and the highest interface value.

Name
The name of this interface.

Description
A textual description of this interface.

Status
The current operational status of this interface.

Port ID
The port identity for this interface type.

EquPos
The equipment position for the port interface, within the chassis or device.

Application
The application using this port. The ICP and Server E1/T1 ELU7 interface information views display this field.

ICU Interfaces Table View

Access: *From the Interfaces Information view, click* **ICU Information***.*

This view shows Intercept Computer interfaces, which identify applications using ICU ports (voicemail, directory, ccm, or ancd). Double-click any entry in this ICU Interface table view to access the ICU Interface Detail view. Make changes to the interfaces in this detail view.

IF Index
A unique value for each network port.

Port ID
Port identity for this interface type.

Equip Position
The equipment position for this port.

Application
The application using the ICU port.

OPI Information Table View

Access: *From the Interfaces Information view, click* **OPI Information***.*

This view shows data for each switch board attendant extension. Double-click any entry in the OPI Interface Table view to access the OPI Interface Detail view and change default values.

IF Index
A unique value for each OPI port.

Port ID
The port identity for this interface type.

Equip Position
The equipment position for this port.

OPI Type
The type of OPI port.

Call Information Logging Table View

Access: From the Interfaces Information view click **CIL Information.**

This view shows data for all call information logging interfaces. Double-click any entry in this table to access the Call Information Logging Interface Detail view and change default values.

IF Index
A unique value for each network interface. Each value is indexed to the Call Information Logging interface table.

Port ID
The port identity for this interface type CIL id (SI-x).

Equip Position
The equipment position for this port.

Computer Telephony Interfaces Table View

Access: From the Interfaces Information view, click **CTI Information**.

This view provides data for each computer telephony interface of an MD110 that are recognized via MML commands. The Computer Telephony Interfaces functionality is only supported for MD110 BC 8 firmware and later.

Double-click any entry in the view to access the Computer Telephony Interface Detail view and change default values.

IF Index
A unique value for each network interface appears in each column of the Computer Telephony Interface table.

Port ID
The port identity for this interface type.

Equip Position
The equipment position for this port.

ISDN Basic Rate Extensions Table View

Access: From the Interfaces Information view, click **ISDN SO Information**.

The ISDN Basic Rate Extensions Table displays Integral Services Digital Network basic rate extension information for MD110. SO refers to an adapter which enables a single digital extension for all digital telephone functions, and provides basic rate access for data applications. This functionality is only supported for MD110 BC 8 firmware and later. Double-click any entry in the view's table to access the ISDN Basic Rate Extensions Detail view and change default values.

IF Index
A unique value for each network interface of an ISDN S0 port.

Port ID
The port identity for this interface type directory number for the ISDN S0 port.

Equip Position
The equipment position for this port.

VCU Interfaces Table View

Access: From the Interfaces Information view, click **VCU Information**.

This view shows data for each Voice Compression Unit board. Double-click an entry in the VCU Interface Table view to access the VCU Interface Detail view and change default values.

IF Index
A unique value for each network interface of a VCU board.

Type
The VCU board interface type.

Equip Position
The equipment position for this board.

Config
The configuration of this board.

Mode
The compression mode used for this VCU board.

Server (E1/T1 ELU-7) Table View

Access: From the Interfaces Information view, click **Server Information**.

This view shows data for the Server interfaces connected via E1/T1 ELU-7 interface. Double-click any entry in this view's Server Table to access the Server Detail view and change default values.

IF Index
A unique value for each network interface of a server interface.

Port ID
The port identity for this interface type directory number for a Server Interface.

Equip Position
The equipment position for this port.

Application
The application using the Server port.

Data Extensions Table View

Access: *From the Interfaces Information view, click* **Data Extns Information**.

The Data Extensions Table view shows data extensions that are programmed to generate alarms. Double-click any entry in the Data Extensions Table to access the Data Extension Information Detail view and change default values.

IF Index
A unique value for each interface.

Port ID
Identity for this interface type.

Equip Position
The equipment position for this interface.

DNA Interconnections View

Access: *From the Interfaces Information view, click* **Connections Information**.

This view displays neighbor information from the agent DNA mib. Double-click any entry in the view's table to access the Connections Information Detail view and change default values.

IF Name
The name of this interface.

Neighbor Address
The IP address of the nearest neighbor.

Neighbor Name
The product name for the nearest neighbor.

Radio Exchange Table View

Access: *From the Interfaces Information view, click* **Radio Exchange Information**.

This view displays information for each radio exchange and the status of each corresponding base station. The information may appear in two different tables, or in one Radio Exchange table under three columns. Double-click any table entry to access the Radio Exchange Information Detail view and change default values.

Ex Number
The radio exchange identifier.

Equip Position
The equipment position or location of the corresponding base station.

Status
The status of each corresponding base station.

Alarm Information View

Access: *From the MD110 Configuration view, click **Alarm Information.***

This view contains two tables with alarm statistics for this MD110 node.

Agent State
The current alarm state of the MD 110 node. Refer to Table 5 for a list of alarm states.

Alarm Status
The current alarm status of the MD 110 node. Refer to Table 6, *MD110 Alarm States*, on Page 23 for a list of alarm conditions.

Active Alarms Table

This table provides active alarm information for the MD110.

Error Code
The error code for this MD110 alarm.

Number Active
The number of active alarms for the MD110.

Alarm Class
Provides an indication of the severity, or warning, of the trap notification in a network element-specific notation. The warning alarm classes are A4 - critical, A3 - major, A2 - minor, and A1 -

warning. The codes are fed into the agent database from the MD110 PBX.

Alarm Text
The textual description associated with the external alarm code.

External Alarms Table

This table provides information on external alarms to the MD110.

Error Code
The error code associated with the external alarm, which corresponds to the CODE parameter within the ALEXP printout.

Alarm State
Indicates if the external alarm is active or passive.

Alarm Text
The textual description associated with the external alarm code.

PIN Alarm Information

This view provides alarm data for each pin in the agent alarm port, described under *PIN Alarm Information View* on Page 31.

Trap Destination

This view shows trap destination information, described under *DNA Trap Destination Table View* on Page 32.

PIN Alarm Information View

Access: *From the Alarm Information view, click* **PIN Alarm Information.**

This view shows two tables with pin alarm information.

PIN Polling Interval
Indicates interval, in seconds, between readings of the PIN state at agent alarm port.

PIN Alarm Configuration Table

This table shows pin alarm configuration data for each pin in the agent alarm port.

Code
Shows the agent alarm port pin number.

Polarity
Interprets the pin signal as active or passive alarm or else unused.

Class A
Indication of the severity of the trap notification in a network element specific notation.

Descr-Active
Indicates alarm source and recommendation of action.

Descr-Passive
Indicates ceasing alarm.

PIN Alarms

This table shows pin alarm identifying information for the port.

Index
Index of the pin in the alarm port.

Alarm Text
Textual description associated with the pin alarm.

Alarm State
Indicates if the pin alarm is `active or passive`,
Otherwise, the pin is not configured.

Alarm Class
Indicates alarm class for this pin.

DNA Trap Destination Table View

Access: *From the Alarm Information view, click **Trap Destinations**.*

IP Address
The IP address to which this trap is being sent.

Sequence
The sequential order in which this trap is being sent.

Route and Trunk Information View

Access: *From the MD110 Configuration view, click **Route + Trunk Information**.*

Trunk Endpoints

The Trunk Endpoints Table identifies trunk endpoints by blocktype and position.

IF Index
A unique value for each network interface of a trunk endpoint. These values are the similar

(composite) values taken from the MD110 Interface table.

T1 Block Type
The type of TL-block in MD110 controlling the trunk endpoint, corresponds to the MML (man machine language) parameter RO TYPE.

Equip Position
The equipment position for the port, which corresponds to the MML parameter EQU.

Route Endpoints

The Route Endpoints Table shows router endpoints by type and bearer capacity; the endpoint provides information for each route in the node. The view fields are described below.

Number
The identification number for the route. Corresponds to the MML parameter.

Type
This route-type corresponds to the MML parameter RO SERV-D3.

Bearer Cap
The capacity for bearer channels for a route endpoint or a trunk endpoint.

Signalling
The type of signalling diagram for the route. Corresponds to the MML parameter RO SIG-D11.

Route - Trunk Table

The Route - Trunk table displays data link information between the route and trunk endpoints. The table also displays the number of channels for a route endpoint on each trunk endpoint.

Route.IF
The trunk endpoint If index.

Endpoints
The number of bearer channels for a route endpoint or a trunk endpoint.

LIM Table View

Access: *From the MD110 Configuration view, click **LIM Information**.*

This view presents a table with information for each LIM appearing in the Device view, and is described below. Double-click an entry to access the LIM Detail view.

Number
If this I/O (input/output) LIM shows a value of 1, the value reflects "`the only LIM present`".

Location
The physical location of the LIM.

Status
Shows the operational status of the LIM. The status values are `up or down`.

Group Switch Information View

Access: *From the MD110 Configuration view, click **Group Switch Information**.*

This view shows tables with statistics on each group switch and the group switch link.The Group Switch Link Table will not be instantiated if there is no group switch in the MD110. The view fields are described below.

Group Switch Operational Status
The operational state of the group switch. Values are `up`, `down`, `unknown`, or `notPresent`.

GS Active Side
The active side of a group Switch. Values, depending upon the current active side, are `side0` or `side1`.

Group Switch Table

This table presents information on each Group Switch; the fields are described below.

Index
The index to the Group Switch table. The values start at 1.

Status-Side0
The operational state of the group Switch (side0).

Status-Side1
The operational state of the group Switch (side0).

Group Switch Link

This table presents information on each Group Switch Link.

Index
Shows the sequence number for the group switch links.

Equip Position
The equipment position in the LIM for the group switch link.

Mult Position
If multiple group switch links exist, the total number of links appear in this column.

Agent Information View

Access: *From the MD110 Configuration view, click the* **Agent Information** *button.*

The Agent Information view provides identification information for this MD110 agent.

Agent Board Hardware Version
Indicates MD110 release information. This data is not automatically generated by the MD110/agent and must be set by a manager.

Serial Number
The agent board serial number programmed at manufacturing time.

Base System Version
The agent board hardware version programmed at manufacturing time.

Application Version
The application version stored in flash memory.

Agent State

Displays the state of the connection between the agent and MD110. Values are listed in Table 8.

<p style="text-align:center">**Table 8:   Agent State Values**</p>

Connection State	Description
OK	The agent has established a connection to the attached MD110 and all MIB objects are instrumented.
linkDown	The connection between the agent and MD110 is down.
updatingMIB	The communication between the agent and MD110 is working and the agent is updating the information base. The agent can not yet provide its services to any manager.
agentFault	The agent is not operational due to an internal fault.

Alarm Status

Lists the alarm state of this agent.

Cold Start Initiate

Shows the value 1 during Cold Start of the agent. A manager initiates a coldstart of the agent by setting the value to 1, under the condition that the value was 0.

Attempts to set the value to 0 or to 1 if it already is 1 will not initiate any action by the agent. Values are `Option` or `Start Now`.

Last Change

Displays the date and time the view state of the port was changed.

IP Network Mask

Displays the IP address and network mask for this device.

Phy Address

The (MAC) address of the port.

Bandwidth

The amount of bandwidth being utilized by this port.

Packet Size

The size of the packet being passed on this port.

Device Configuration View

***Access:** From the **Icon Subviews** menu for the Device icon, select **Configuration**.*

The Device Configuration view for the switches provides access to views that allow you to enable/disable redundancy and reconfigure model interfaces. Double-clicking a table column

entry accesses the *Interface Configuration View* on Page 36.

Figure 8:   Device Configuration View
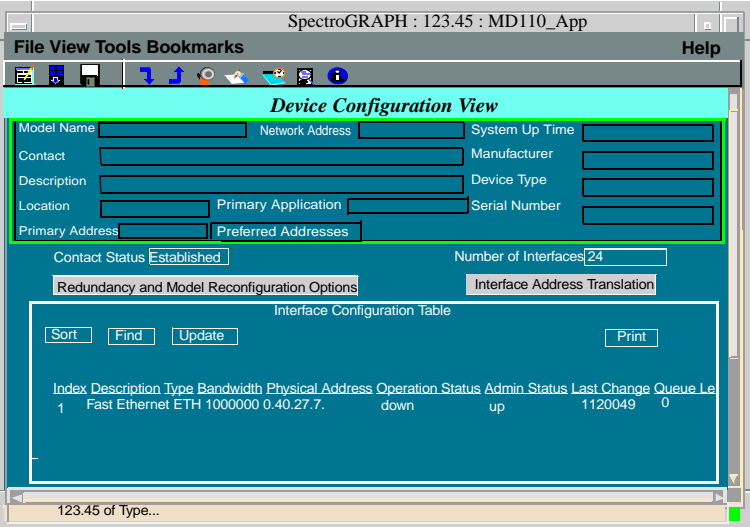
Interface Configuration View

Access: *From the Interface Icon's Subviews menu, click **IF Configuration**.*

This view displays port-specific information for this device.

Operation Status

Displays the current operating state of the port. This state is set using the **Admin Status** button described below. Possible values are `On,` `Off,` or `Test.`

Admin Status

This field provides a button that allows you to change the current administrative state (turn ports on or off) of the port. Possible values are `On,` `Off,` or `Test.`

Performance Views

This section describes the Performance views available for models of the MD110 device in SPECTRUM.

Performance views provide statistical information about the operation of the device and packet information for the device and its ports. The following performance views are described in this section:

- *Device Performance View* on Page 37
- *Interface Performance View* on Page 38

For more information on these views, refer to the **SPECTRUM Views** documentation.

Device Performance View

Access: *From the **Icon Subviews** menu for the Device icon, select **Performance.***

This view (Figure 9) includes both a graph and a table that show current, average, and peak values for the following performance statistics:

- *Frame Rate
- % Received

- % Transmitted
- % Error
- % Discarded

The view also provides button access to the SNMP Agent Detail view, which shows pie charts with error breakdown statistics.

Figure 9: **MD110 Performance View**
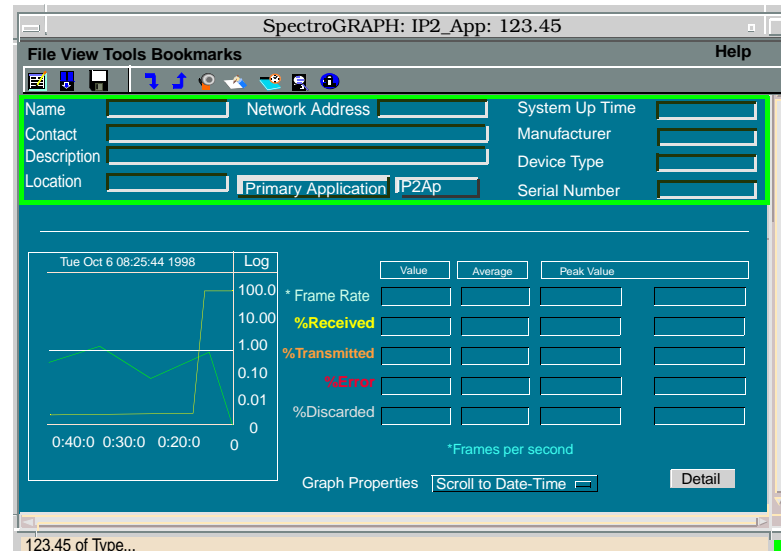
Interface Performance View

Access: *From the* **Icon Subviews** *menu for the DevTop view's Interface Icon, select* **Performance.**

This view includes both a graph and a table that show the following current, average, and peak performance statistics for the agent interface:

- Load
- * Packet Rate
- % Error
- % Discarded

The view also provides button access to the Interface Detail view, which shows pie charts with packet and error breakdown statistics.

Model Information Views

This section provides a brief description of the Model Information views available for models of the MD110 device in SPECTRUM.

Model Information views provide descriptive and configuration information about SPECTRUM models of individual devices, interfaces, and applications. Figure 10 shows an example of the Model Information view accessed from the **Icon Subviews** menu for the MD110 PBX model's Device icon. Model Information views are also available for each of the Interface icons in the Interface Device and Interface Device Topology views, and for each of the Application icons in the Application view. Although these views may vary slightly depending on the particular entity being modeled, their basic layout and content are similar for most SPECTRUM management modules. Therefore, these views are described in more detail in the **SPECTRUM Views** documentation.

Figure 10:   **Model Information View**

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